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County Agent's Notes: Organic matter does matter - January 14, 2002

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When we talk about soil quality, organic matter is misunderstood by most people regardless of the situation. Farmers and home gardeners have become more aware of the benefits of organic matter as a result of educational efforts by virtually every sector of agriculture, but most people still do not really appreciate the benefits it provides.

Usually we consider organic matter as plant and animal residues we add to and mix into the soil. When we add composted leaves or manure, we are definitely improving the soil, but this is only organic material; the real benefits come when we increase the organic "activity" in soil. Improved organic activity results from not only adding these and other "amendments", but from their combining to improve the ability of the soil to support the growth of plants.

Organic material may be described as anything that was once alive and is now in or on the soil. For it to increase the organic activity taking place in the soil, this material must be broken down. The term "humus" has been thrown around for a long time as a way of describing soil that is rich in organic material in the process of decomposition, and is also active with microorganisms, earthworms and other forms of soil life.

Only about ten percent of the organic material we add to soil remains after decomposition. This small portion is relatively stable in the soil since it is resistant to further breakdown; adding to the "bulk" of the soil. Those who have built raised beds with large quantities of compost have witnessed this. A bed that is full in the beginning will after a year or so need refilling as a result of decomposition. Only a very small portion of this organic matter will be converted to available nutrients each year, depending on temperature, oxygen supply, moisture conditions, and the amount of tillage that is done.

Soil with three percent organic matter, which is good for agricultural soils, will gain 60 to 80 pounds of nitrogen, 12 to 15 pounds of phosphate, and 5 to 10 pounds of sulfur each year, plus small quantities of potash and essential micronutrients. These nutrients are released mostly in the spring and summer, so warm-season plants benefit most from organic-matter.

Organic matter acts like a sponge, absorbing and holding up to 90 percent of its weight in moisture. An added benefit of this water-holding capacity is that organic matter will release most of this water directly to plants. Clay, on the other hand, is capable of holding large amounts of water, but most of it is unavailable to plants.

Organic matter allows soil particles to bind themselves together to form larger particles called "aggregates", which improves soil structure. This is the reason soils with lots of "humus" do not "run together" and form crusts the way low-organic soils do. Plants growing in soils that are rich in organic matter can grow better root systems, and we all know that a good root system is essential for healthy plants. This soil also allows for the development of microorganisms like mycorrhizal fungi, rhizobium bacteria, and actinomycetes, which fix nitrogen from the air.

Organic matter helps soils resist erosion. This benefit of organic matter is not widely known, but is easily understood by the fact that soil aggregation is improved. One to three percent organic can reduce erosion by one third, and if the soil surface is not disturbed soil loss can essentially be stopped.

Building soil organic matter is a long-term process but it is essential to "rebuilding" soil that is not productive. Some of the things to do are: Reduce or eliminate tillage and thereby the rapid breakdown and removal of organic matter. Reduce soil loss; if topsoil is being lost then organic matter is being lost. Test the soil and provide the lime and fertilizers needed to grow good plants and to feed soil microorganisms. Utilize cover crops as an added way of reducing erosion and creating new organic matter.

Organic matter is part of a good soil, not just something you add to your "dirt". Without organic matter, it's really not soil at all; just a mass of stuff taking up space. We all know organic matter is good for our plants; now let's do our part in building it and keeping it going. Whether you are growing a bed or petunias or a field of cotton the principle is the same.

There's lots more to this story. Call the Extension Service Office if you want more information. Our numbers are [redacted] and [redacted]. I will also visit with you by e-mail at [redacted].